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INTRODUCTION

In accordance with the City Council's September 1990 referral (#9-18-90-13a) we have compared San Jose Fire Department's provision of Emergency Medical Services (EMS) with Santa Clara County contracted paramedic services. We conducted this review in accordance with generally accepted government auditing standards. We limited our review to gathering and presenting information about EMS and did not make any recommendations. The Scope and Methodology Section of this report specifies other areas where we limited our review.

The City Auditor's Office thanks those officials from the City of San Jose and Santa Clara County who gave their time, information, insight, and cooperation. Their efforts made our study possible and more meaningful.

SCOPE AND METHODOLOGY

Our review provides detailed information to the San Jose City Council and the City Administration regarding Emergency Medical Services (EMS). This information should aid the City Council and Administration in setting EMS policies and service level objectives and choosing among alternative service delivery methods.

As part of our review, we developed a computerized database of selected EMS events. This database contains over 30 fields of information for over 500 EMS events. In addition, we created several computer spreadsheets with formulae for calculating various time segments in the chronology of EMS responses. The City Auditor's Office will share these electronic data files with both City of San Jose and Santa Clara County administrators and provide advice and assistance upon request.

Sources Of Information

We reviewed the following documents:

- Santa Clara County's 1977 *Agreement Between the City of San Jose and the Santa Clara County Central Fire Protection District Providing for the Furnishing by City of Certain Fire Services Within a Portion of the Service Area of Said District* (known as the "First Responder Agreement")
- Santa Clara County's 1984 *Agreement Between the Santa Clara County Central Fire Protection District and the City of San Jose for Automatic Aid Response of the Respective Fire Departments* (known as the "Auto-Aid Agreement")

- Santa Clara County’s 1988 service agreements for emergency ambulance services with Medevac, Inc. and SCV Paramedical Services
- Donald Cook Associates, Ltd. January 1989 *Review of Santa Clara County EMS* for Santa Clara County Public Health Department
- Santa Clara County Grand Jury’s 1989-90 Final Report on *Inspection of the 911 Services of the Communications Department*
- San Mateo County’s 1990 *Agreement with Hartson Medical Services and Baystar Medical Services for Countywide Emergency Ambulance Service*

We interviewed officials from the following agencies:

- San Jose Fire Department
- San Jose Office of the City Attorney
- Santa Clara County Communications Center
- Santa Clara County EMS Administration
- San Mateo County EMS Administration

We obtained other background information or assistance from:

- International City Management Association
- Los Angeles Management Audit Office
- Portland Office of the City Auditor
- San Jose City Manager’s Office
- San Jose Information Systems Department (ISD)
- San Jose Office of Policy Analysis
- San Jose Police Department
- Santa Clara County Documents Library

We used the following standard management reports:

- Santa Clara County Communications Reports:
 - Computer Aided Public Safety System (CAPSS) **Fire Log***
 - Computer Aided Dispatch System (CADS) **Medical Case Log**¹
- San Jose Information Systems Department (ISD) Reports for the San Jose Fire Department:
 - Uniform Fire Information Reporting System (UFIRS) monthly report series

In addition, we obtained the following special data extract reports for use in this study:

- Santa Clara County Health Department: Paramedic Dispatch System (PDS) screen prints of event dispatch and **Pre-Hospital Care Report*** information
- San Jose ISD for the San Jose Fire Department: CAPSS computer tape full record dump for selected days

Time Period Studied

We reviewed all eligible emergency medical events from six randomly selected days during the time period of July 1, 1990, through September 30, 1990. At the time of our review, those months were the only ones for which we could obtain copies of the CADS **Medical Case Log***. The significance of the **Medical Case Log*** lies in the fact that it is the only report which shows the Santa Clara County paramedics' response times in both minutes and seconds.

* Refer to APPENDIX A: Glossary of Terms

Coincidentally, our sample period covers the last three months before the City of San Jose began emergency dispatch operations from its own City Communications Center on October 1, 1990. Thus, the results of our study will provide a baseline of service levels and response times that can be compared at a later date with those of the new City Communications Center (see FINDING V).

Statistical Sample Of Emergency Medical Events

Our review was based primarily on an examination of a representative statistical sample of responses to calls for EMS. We quantified and compared data on the dispatch, turnout, travel, and **total response times**^{*} for both the San Jose Fire Department (SJFD) and Santa Clara County contracted paramedics. We categorized and described the nature and frequency of the various types of EMS events and what action the SJFD and the County paramedics took.

Confidence And Precision Of Sample Accuracy

Our sample selection criteria resulted in a total sample of 538 EMS events. The size of our randomly selected sample provides a 95 percent confidence level, with a precision of plus or minus 2 percent, that our sample results are representative of all EMS events in the time period studied.

^{*} Refer to APPENDIX A: Glossary of Terms

Factors Affecting Sample Selection Criteria

Based on our review of the SJFD report The Total Number Of Alarms And Loss By Time Of Day vs. Day Of Week for July and August 1990, we found that Mondays are low volume EMS event days while Fridays tended to be the highest volume days. To ensure that our sample was representative, we randomly selected six different days of the week. Thursday is the only day of the week we did not include in our sample.

All **Code 3*** EMS events (requiring red lights and siren) were eligible for inclusion in our review. We excluded from our sample **Code 2*** events (urgent, but no red lights and siren) that occurred on the days we selected. The SJFD is not dispatched to these **Code 2*** events. We also excluded some **Code 3*** events from our sample because the reporting party or another public agency, such as the San Jose Police Department, requested that the SJFD not respond. We excluded these events because we could not compare the SJFD's performance against the County paramedics. Similarly, we excluded **Code 3*** events when both the SJFD and the County paramedics were dispatched, but the dispatch was cancelled before they were **en route***.

Most of the 538 events we included in our sample appear as “*EMS*” type calls on the **Fire Log*** report; however, we did include a few “*Rescue*” type calls. We included these rescue calls (usually involving traffic accidents) because both SJFD and the County paramedics were dispatched and provided EMS.

* Refer to APPENDIX A: Glossary of Terms

Finally, we excluded from our sample those events which were multiple calls reporting the same incident. For example, sometimes more than one citizen reports or calls in the same event. If the SJFD dispatched more than one unit* as a result of multiple 911 calls, we counted the event only once in our sample and showed that multiple units were dispatched.

Sample May Not Be Representative Of The Whole Year

Because our sample of events covers only a three-month period, we are aware that seasonal variations may effect the nature of 911 calls or response times. Accordingly, we reviewed the number of 911 calls by quarter for fiscal years 1988-89 and 1989-90 and found only small quarterly variances in the number of calls. We do, however, know that the frequency of SJFD multiple vehicle responses may be higher from May to October. This is because SJFD's response guidelines recommend that during grass fire season (May through October) **Two Piece Engine Companies*** with **Patrol Tankers*** respond with both vehicles to EMS calls. Thus, a number of the multiple vehicle responses in our sample may not be indicative of the severity of the medical emergency.

Finally, we were not able to determine the extent to which the nature of emergency medical incidents vary by the time of year. For example, it is possible that bicycle accidents occur more frequently in summer months. Furthermore, it is possible that seasonal traffic patterns effect emergency response times. As a result, our sample accurately reflects EMS activity only for July 1990 through September 1990 and may not be statistically representative of 1990 as a whole because of possible seasonal influences.

* Refer to APPENDIX A: Glossary of Terms

BACKGROUND

This report addresses the nature of EMS events in San Jose and the resultant services provided. This report is intended to provide the San Jose City Council and the City Administration with the information needed to develop EMS policies and service objectives and evaluate alternative service delivery methods.

This Background Section describes the overall volume of EMS calls and their source and location. Subsequent sections of this report provide more details about response times, services provided, the nature of EMS events, and the equipment used to respond to EMS events.

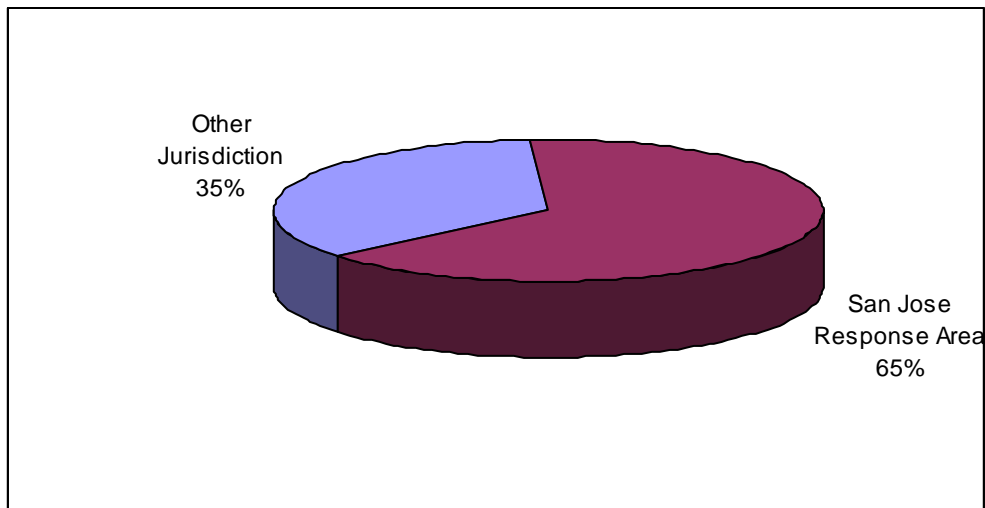
Volume And Jurisdiction Of EMS Events

On the six days we selected for our sample there were 966 EMS events in the County² to which County contracted paramedics were dispatched. As shown in GRAPH 1, 65 percent of these EMS events were in San Jose fire response areas.

² Excludes events in Campbell and Palo Alto because they have their own paramedics.

GRAPH 1

FIRE JURISDICTION OF EMS CALLS (IN COUNTY PARAMEDIC RESPONSE AREAS)

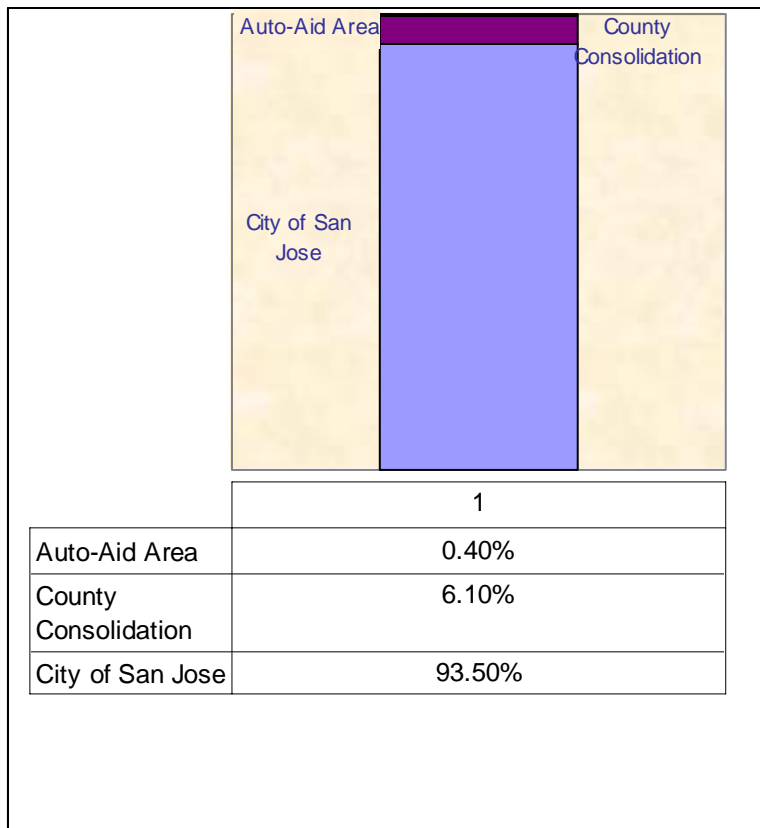


SJFD's response area includes areas within San Jose's city limits, Santa Clara County consolidation areas covered by a **First Responder*** Agreement, and areas covered by an **Auto-Aid*** Agreement. The other 35 percent of calls to which County paramedics responded were in other cities' jurisdictions, Central Fire Protection District, or Department of Forestry fire response areas. As shown in GRAPH 2, the majority of calls in San Jose fire response areas (93.5 percent) were within the City's limits.

* Refer to APPENDIX A: Glossary of Terms

GRAPH 2

FIRE JURISDICTION OF EMS CALLS (In San Jose Fire Response Areas)

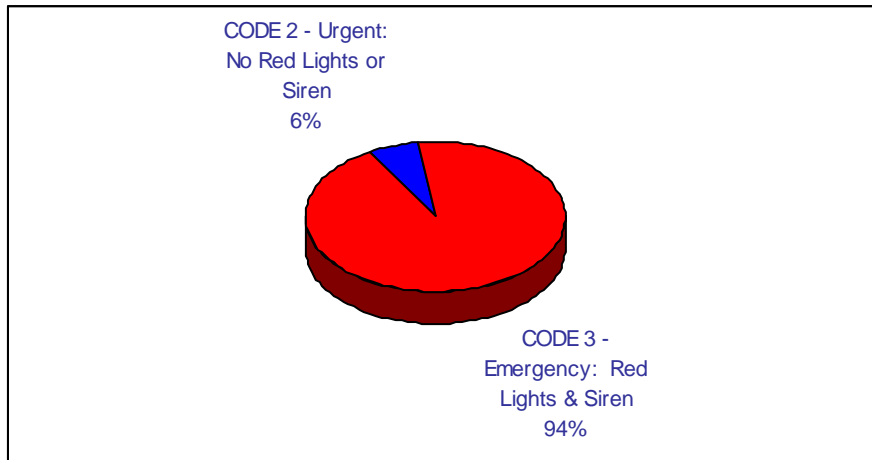


Of the EMS calls in San Jose fire response areas, 94 percent were **Code 3*** medical emergencies while 6 percent were **Code 2*** non-emergency medical events as shown in GRAPH 3. The SJFD is dispatched only to **Code 3*** situations; therefore, these were the only events we included within the scope of our study. Our sample selection criteria resulted in 538 events being selected for analysis. We estimate that this sample represents approximately 6 percent of the total **Code 3*** events in San Jose from July 1 to September 30, 1990.

* Refer to APPENDIX A: Glossary of Terms

GRAPH 3

DISPATCH PRIORITY CODE OF EMS CALLS



A breakdown of EMS event volume for the days we selected for our sample is shown below:

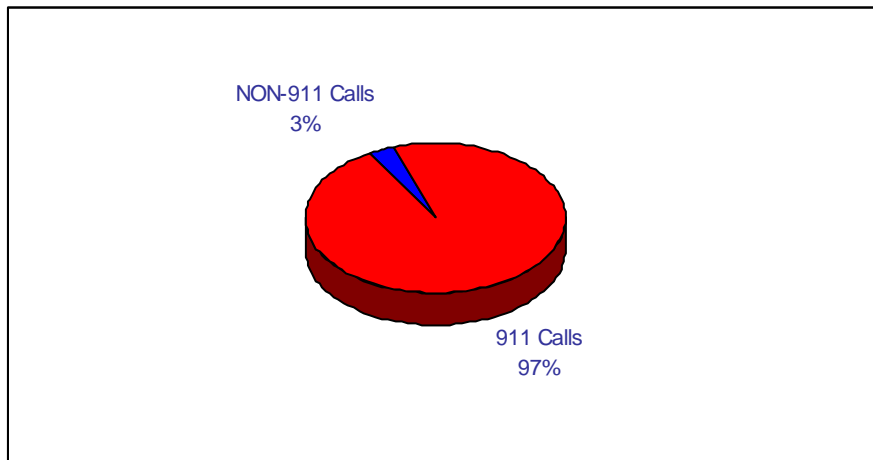
DAY	DATE	VOLUME	
		<u>No.</u>	<u>Percent</u>
Sunday	9/02/90	89	16.5%
Monday	8/27/90	67	12.5%
Tuesday	7/24/90	87	16.2%
Wednesday	8/08/90	84	15.6%
Friday	9/21/90	104	19.3%
Saturday	7/21/90	<u>107</u>	<u>19.9%</u>
TOTAL		<u>538</u>	<u>100.0%</u>
AVERAGE per day = 90			

Source Of EMS Calls

Citizen reports of emergencies through the 911 system accounted for 97 percent of the 538 EMS calls in our study. The remaining 3 percent of the calls were non-911 originated as shown in GRAPH 4. For example, some emergency calls go via direct telephone lines to the County's Communications Center or arrive through dispatch radio communications from other public agencies such as San Jose Police Department or the Santa Clara County Sheriff Departments.

GRAPH 4

SOURCE OF EMS CALLS



FINDING I

OVERALL, THE SAN JOSE FIRE DEPARTMENT MET ITS EMERGENCY MEDICAL SERVICES TIME RESPONSIVENESS OBJECTIVES

The San Jose Fire Department (SJFD) is the designated **First Responder*** to Emergency Medical Services (EMS) events within San Jose's fire response areas. In addition, for 1990-91, the SJFD has two EMS **travel time*** objectives and one EMS **turnout time*** objective. Our sample results revealed that:

- The SJFD arrived before the County paramedics 86 percent of the time;
- The SJFD's average EMS **total response time*** was 5 minutes 50 seconds compared to 9 minutes 39 seconds for the Santa Clara County paramedics;
- The Santa Clara County paramedics did not meet their contract required EMS time responsiveness objective;
- The SJFD met its two EMS **travel time*** objectives on a City-wide basis;
- 9 of 28 fire stations did not meet one of the SJFD's **travel time*** objectives of 4 minutes or less for 70 percent of EMS events;
- 5 of 28 fire stations did not meet the other SJFD **travel time*** objective of 6 minutes or less for 90 percent of EMS events;
- City-wide, the SJFD fell 2 percent short of meeting its EMS **turnout time*** objective of not exceeding 2 minutes for 90 percent of EMS events;
- 16 of 28 fire stations did not meet the SJFD's EMS **turnout time*** objective of not exceeding 2 minutes for 90 percent of EMS events;

* Refer to APPENDIX A: Glossary of Terms

- The SJFD did not meet its EMS **travel time*** objectives of 4 minutes or less for 70 percent of EMS events in City Council Districts 4, 7, and 8;
- The SJFD met its EMS **travel time*** objective of 6 minutes or less for 90 percent of EMS events in all City Council Districts; and
- The SJFD did not meet its **EMS turnout time*** objectives of 2 minutes or less for 90 percent of EMS events in City Council Districts 2, 4, 6, 7, 8, 9 and 10.

Response To EMS Calls

Part of the City Auditor's sampling plan for EMS events was to:

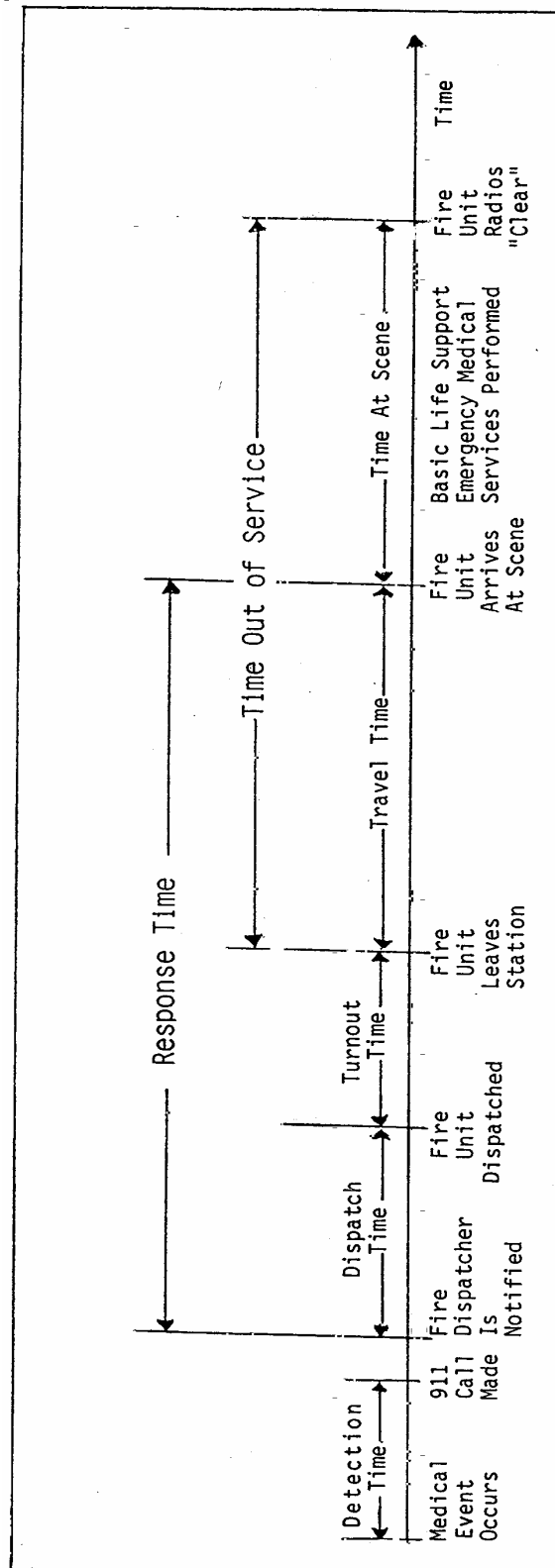
1) calculate how long it took the SJFD and the Santa Clara County paramedics to respond to an EMS event, 2) determine if the SJFD was meeting its own EMS time responsiveness objectives, and 3) determine if the County paramedics were meeting the EMS time responsiveness objectives in their County contract.

DIAGRAM I shows the various EMS response time segments for which we calculated average SJFD response time. A more extensive diagram of the EMS response process prior to October 1, 1990, for both the SJFD and County paramedics can be found at APPENDIX B.

* Refer to APPENDIX A: Glossary of Terms

DIAGRAM I

ELEMENTS OF AN EMS RESPONSE



Brief descriptions of the various segments in an EMS response follow.

911 Call Handling

After a 911 call-taker answers an EMS call, there is a period of time during which the 911 call-taker determines the type of emergency, verifies the location, and routes the call to the appropriate dispatcher. Santa Clara County's Communications Center officials told us that it took an average of 6 seconds for a 911 call-taker to answer an EMS call (measured from time of first ring to the call-taker's answer). These officials could not provide any reports to support their 6-second assertion. In addition, these officials could not document the length of time from when a 911 call-taker answers an EMS call to when the appropriate dispatcher is notified. Since the 911 call handling time segment is not captured and reported on either the **Fire Log*** or **Medical Case Log*** reports, we did not include any estimate for this EMS time segment.

Dispatch Time

The first EMS time segment we were able to measure was the time from when the primary medical and fire dispatchers are notified of an EMS event to when the EMS event location is verified. This time segment took an average of 6 seconds.

We next attempted to measure how long it took the primary dispatcher to route the EMS call to the secondary dispatcher, who must locate the nearest available unit and make the actual radio dispatch. Because the

* Refer to APPENDIX A: Glossary of Terms

source documents showing the times for routing to secondary dispatchers had the seconds truncated, we could not calculate the actual length of time required for this process. Thus, it may have taken as much as 59 seconds longer to route to the secondary dispatcher than the time shown on the **Fire Log*** or **Medical Case Log*** would indicate. Therefore, we can only estimate that it took approximately 27 seconds on average to route the call from primary to secondary dispatchers.

For our sampled EMS events, the average dispatch time from when the primary dispatcher was notified of an EMS event to when the secondary dispatcher dispatched a unit was 1 minute 14 seconds for the SJFD and 1 minute 57 seconds for the County paramedics.

Turnout Time

Turnout time* is the EMS response time segment from dispatch notification to when the dispatched unit goes **en route*** to the emergency scene. SJFD and the County paramedics' performance was nearly identical at 1 minute 24 seconds and 1 minute 22 seconds, respectively.

Travel Time

The SJFD defines **travel time*** as the time from when a **unit*** goes **en route*** to its arrival at the emergency scene. We consider **travel time*** to be only one part of **total response time*** as explained in the **Total Response Time*** Section below.

* Refer to APPENDIX A: Glossary of Terms

Total Response Time

The SJFD commonly refers to **travel time*** as “response time”. However, as discussed on Pages 33-34 of our August 1990 report, A Preliminary Survey Of San Jose Fire Department’s Management Information On Emergency Medical Services, the Department’s definition is not consistent with what some other authorities use. For example, the International City Management Association’s (ICMA) definition measures response time from when the 911 call-taker answers the call to when the ambulance arrives at the scene.

ICMA’s response time definition probably more closely agrees with the general public’s concept of response time. That is, the **total response time*** would start when someone called 911 and would end when help arrived. However, because we could not measure how long it took to handle a 911 call, we measured **total response time*** beginning with the primary dispatcher answering the EMS call and ending when the SJFD or County paramedics arrived.

Time At Scene

Both the SJFD and County paramedics spend time at the EMS scene providing emergency medical services. Our sample EMS results disclosed that SJFD personnel and equipment remain at the EMS scene an average of 9 minutes 33 seconds after the County paramedics arrive.

* Refer to APPENDIX A: Glossary of Terms

Our sample also showed that SJFD personnel spend on average 12 minutes 29 seconds at an EMS scene, whereas County paramedics stay 9 minutes 16 seconds.

Total Time Out Of Service

Total time out of service (**en route*** to **clear***) measures the length of time that a SJFD **unit*** is engaged in an EMS call and is therefore unavailable for dispatch to another call. In other words, a SJFD **unit's*** time out of service includes both **travel time*** and time at the scene.

We found that the SJFD's average total time out of service was 14 minutes 44 seconds. This compares with the average 50 minutes 12 seconds County Health Department officials indicated County paramedics are out of service.

It should be noted that part of the time that SJFD personnel and equipment are out of service occurs after the County paramedics have departed for the hospital. In 34 percent of the instances when SJFD personnel remain at the EMS scene after the County paramedics arrive, they continue to remain at the scene even after the paramedics have left. In such instances, SJFD personnel remain to take report information, pack up equipment, or provide service to citizens an average of 4 minutes 50 seconds.

APPENDIX C is a summary of average response times for the above EMS response segments for the days we included in our sample. It should

* Refer to APPENDIX A: Glossary of Terms

be noted that the accuracy some of the times shown in APPENDIX C and other places in this report could be dependent on the responding **unit*** securing clear radio air waves to communicate from the field to the Communications Center.

**The SJFD Arrived Before
The County Paramedics 86 Percent Of The Time**

SJFD is the designated **First Responder*** in its fire response areas. In other words, SJFD personnel and equipment are supposed to arrive at an EMS scene to make a medical assessment and provide **Basic Life Support*** before the County paramedics arrive.

Our sample results showed that when both SJFD and County paramedics arrived at the same EMS scene, SJFD personnel and equipment arrived before County paramedics 86 percent of the time.

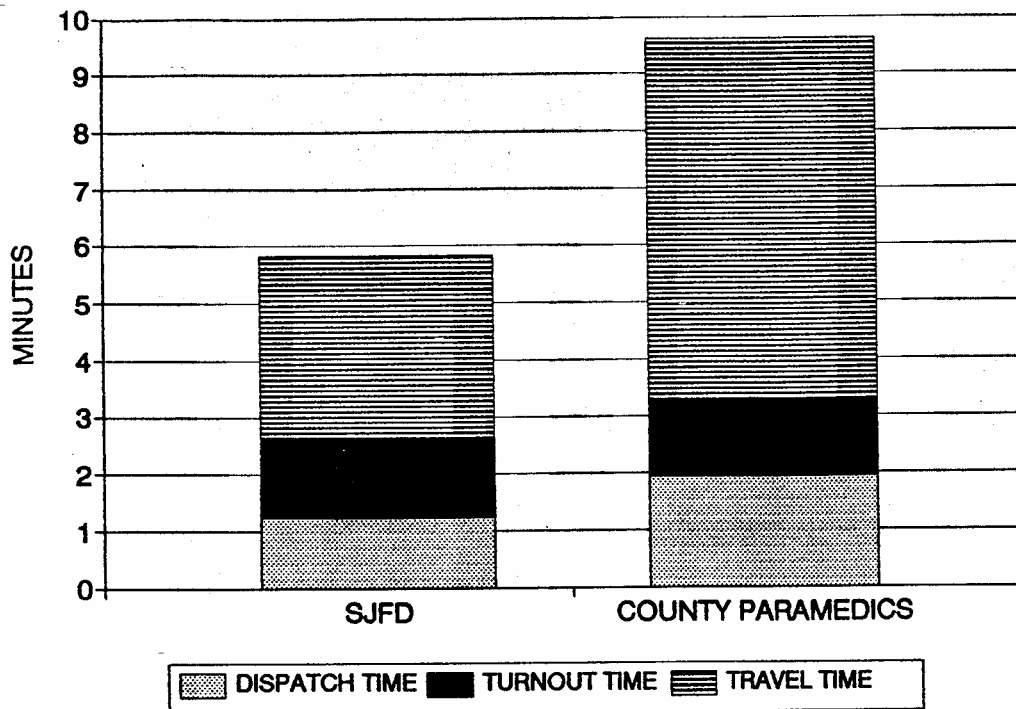
**SJFD's Average EMS Total Response Time
Was 5 Minutes 50 Seconds**

In our sample, it took the SJFD an average of 5 minutes 50 seconds to respond to an EMS event; whereas, it took County paramedics an average of 9 minutes 39 seconds to respond to an EMS event. The time segments making up our calculated EMS **total response times*** are shown in GRAPH 5.

* Refer to APPENDIX A: Glossary of Terms

GRAPH 5

COMPARISON OF SJFD AND COUNTY PARAMEDIC
AVERAGE EMS TOTAL RESPONSE TIME



As shown above, the biggest difference between SJFD and County paramedics response time lies in **travel time***. Our sample study results were that SJFD's **travel time*** was 3 minutes 12 seconds on average while the County paramedics' **travel time*** was almost twice as long at 6 minutes 20 seconds. It should be noted that average SJFD **travel time*** was remarkably consistent on different days of the week, varying only 17 seconds averaged on a City-wide basis. County paramedics' **travel times*** were more subject to variation from one day of the week to another, varying by as much as 1 minute 36 seconds.

* Refer to APPENDIX A: Glossary of Terms

County Paramedics Did Not Meet Their Contract-Required EMS Time Responsiveness Objectives

We also analyzed whether County paramedics were in compliance with the Santa Clara County contract requirement to respond to 90 percent of **Code 3**^{*} “urban” dispatch locations in less than 10 minutes after dispatch notification.²

The Santa Clara County contract does not clearly define what locations are considered urban versus rural. As a result, it was difficult for us to check for compliance. In addition, the County paramedic dispatch records do not indicate whether the incident location is in an urban or rural area. However, we reviewed the location address for each of the 538 calls in our sample and found none to be outside urban areas.

Assuming that all 538 EMS events in our sample were in urban areas, we found that County paramedics’ response times were less than 10 minutes for only 79 percent of the dispatches compared to the contract-required 90%.

On A City-wide Basis, The SJFD Met Its Two EMS Travel Time Objectives But Not Its Turnout Time Objective

The SJFD has three 1990-91 program performance objectives that apply to EMS responses. These performance objectives are:

- **Travel time*** for the first arriving unit will not exceed 4 minutes for 70 percent of emergency responses.

^{*} Refer to APPENDIX A: Glossary of Terms

²The County’s contract requirement covers both the turnout* and travel time* response segments shown in DIAGRAM I on Page 15 on this report.

- **Travel time*** for the first arriving unit will not exceed 6 minutes for 90 percent of emergency responses.
- **Turnout time*** will not exceed 2 minutes for 90 percent of responses.

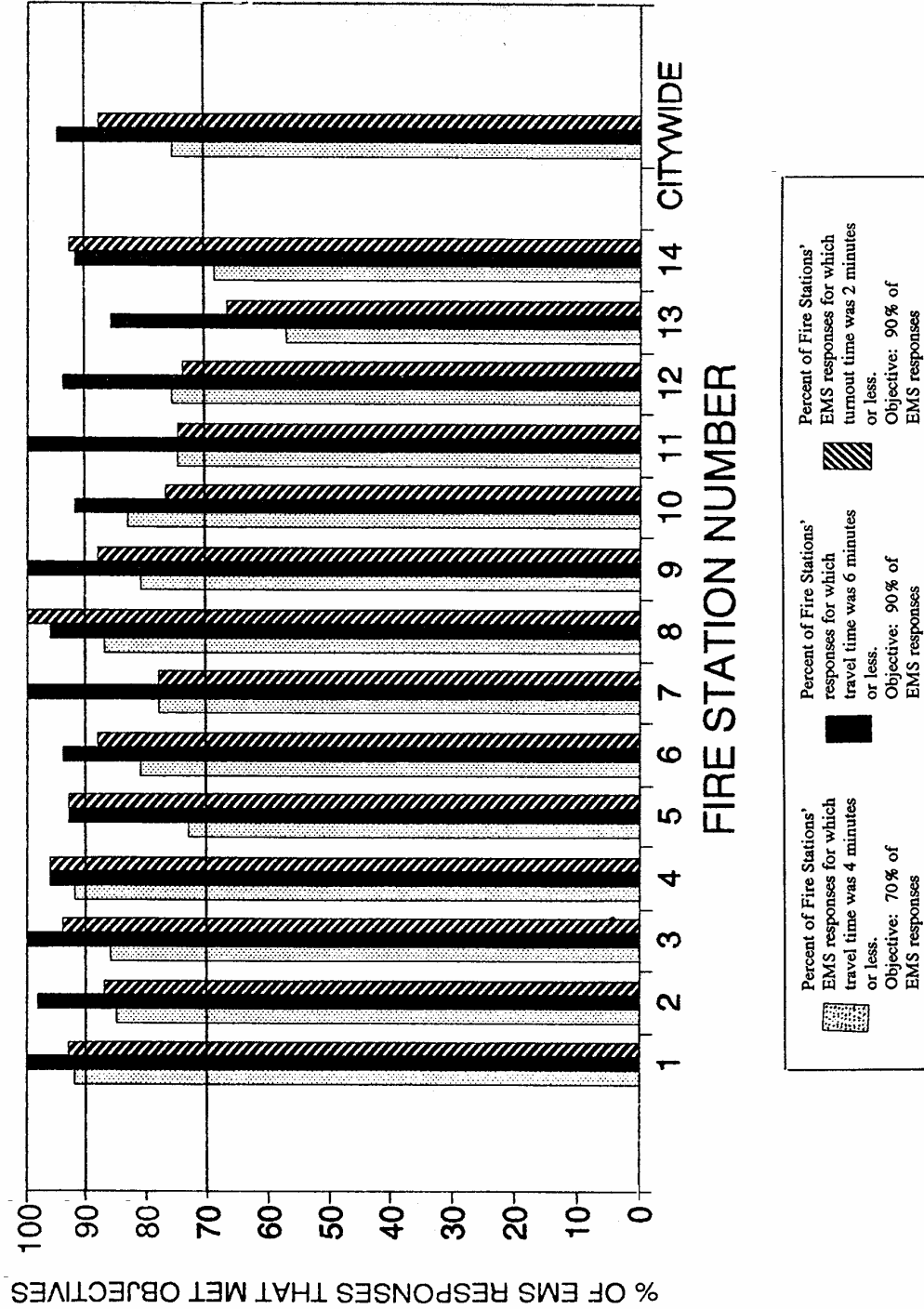
Our sample results showed that the SJFD met both of its **travel time*** objectives on a City-wide basis. **Travel time*** did not exceed 4 minutes for 76 percent of our sampled EMS responses and did not exceed 6 minutes for 95 percent of our sample responses. However, some individual fire stations did not meet the 70 percent within 4 minutes and 90 percent within 6 minutes **travel time*** goals. Specifically, 9 of 28 stations did not meet the 4-minute goal and 5 of 28 stations did not meet the 6-minute goal.

In addition, City-wide, the SJFD fell 2 percent short of meeting its EMS **turnout time*** objective of 90 percent of EMS responses not exceeding 2 minutes. Furthermore, 16 of 28 fire stations did not meet the SJFD's **turnout time*** objective. GRAPHS 6-1 and 6-2 show by fire station the percent of EMS responses in our sample that had **travel times*** of 4 minutes or less and 6 minutes or less and **turnout times*** of 2 minutes or less.

* Refer to APPENDIX A: Glossary of Terms

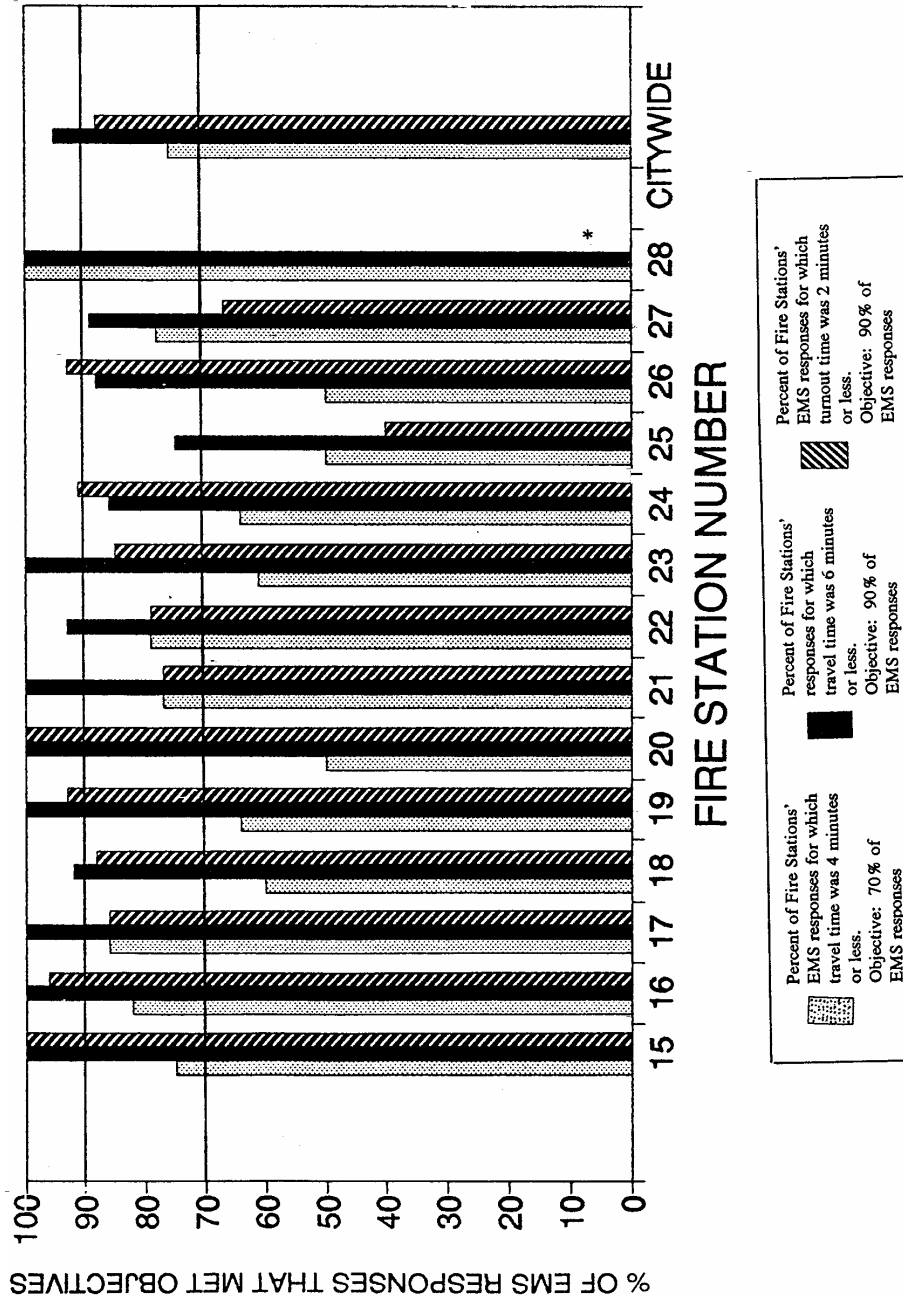
GRAPH 6-1

**SJFD PERFORMANCE ON RESPONSE OBJECTIVES
BY FIRE STATIONS 1 THROUGH 14**



GRAPH 6-2

**SJFD PERFORMANCE ON RESPONSE OBJECTIVES
BY FIRE STATIONS 15 THROUGH 28**



* Station 28 responded to only one EMS event in our sample. Station 28's turnout time for this one EMS event was 2 minutes and 39 seconds. Therefore, Station 28's percent of EMS responses that met objectives is zero in Graph 6-2.

APPENDIX D is a summary of sample results for **travel time*** and **turnout time*** objectives by fire station. In addition, APPENDICES E, F, and G detail average EMS response segment times for Fire Stations 1 through 10, 11 through 20, and 21 through 28, respectively.

**SJFD EMS Travel Times And Turnout Times
On A City Council District Basis**

Further analysis of our sample results revealed that the SJFD:

- Did not meet its objective that **travel time*** would be 4 minutes or less for 70 percent of EMS events in City Council Districts 4, 7, and 8.
- Met its objective that **travel time*** would be 6 minutes or less for 90 percent of EMS events in all City Council Districts.
- Did not meet its objective that **turnout time*** would be 2 minutes or less for 90 percent of EMS events in City Council Districts 2, 4, 6, 7, 8, 9, and 10.

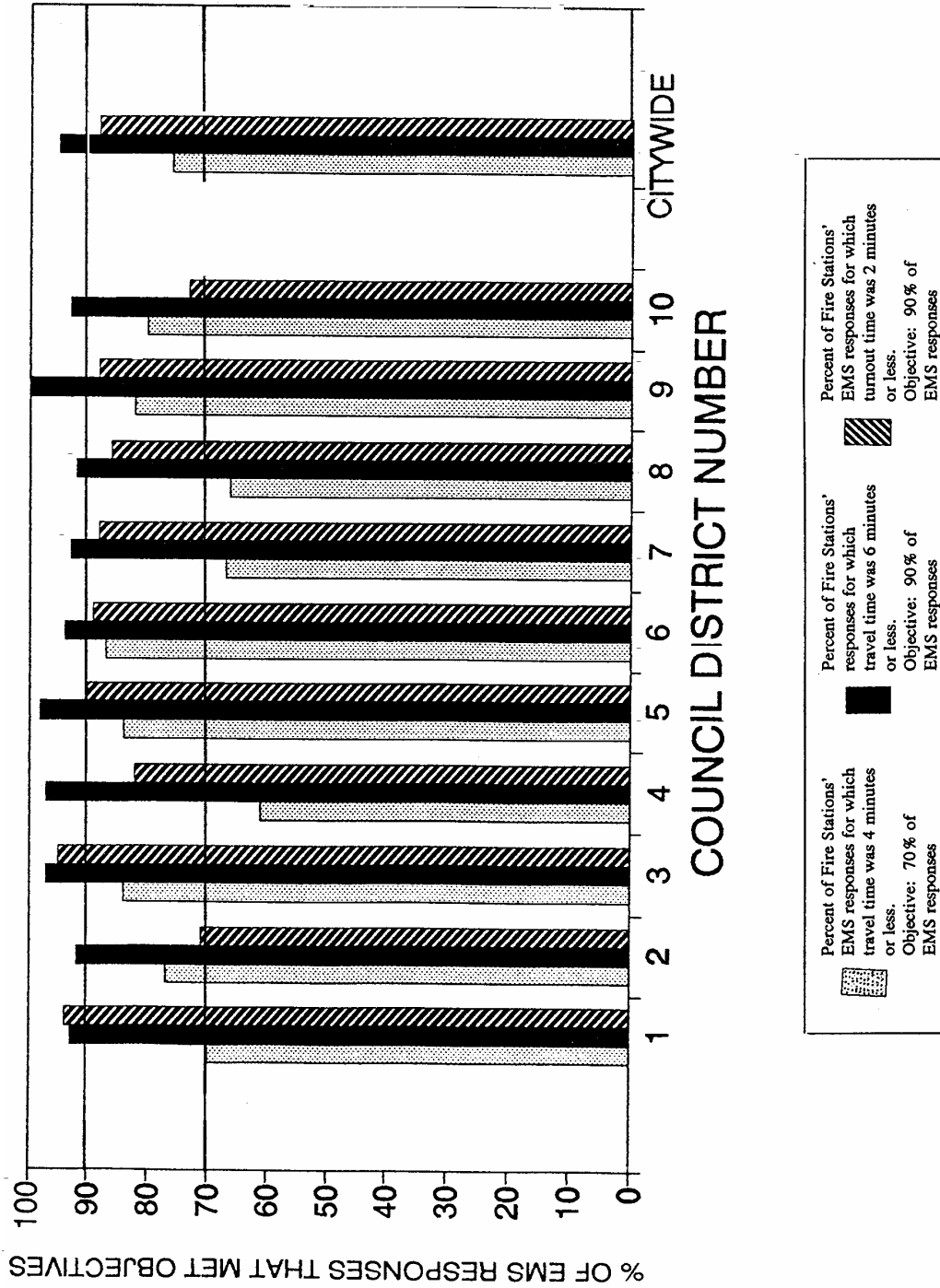
The results of our sample regarding EMS **travel time*** and **turnout times*** are displayed on a City Council District basis in GRAPH 7.

APPENDIX H is a summary of sample **travel time*** and **turnout time*** objective results by City Council District. In addition, APPENDIX I details average EMS response segment times for each City Council District.

* Refer to APPENDIX A: Glossary of Terms

GRAPH 7

**SJFD PERFORMANCE ON RESPONSE OBJECTIVES
BY CITY COUNCIL DISTRICT**



FINDING II

SJFD PERSONNEL PROVIDED ONLY LIMITED DIRECT MEDICAL TREATMENT TO MOST OF THE EMS VICTIMS IN OUR SAMPLE

Both the SJFD and County paramedics code or record the services they provide to EMS victims. Our sample of 538 EMS events revealed that:

- The County paramedics coded 30 percent of the EMS events to which they responded as “**Dry Runs***”
- The SJFD took “no action” after arriving at the scene for 21 percent of EMS calls;
- The most frequent SJFD action taken in response to an EMS event was checking the condition of the victim;
- For 74.7 percent of the EMS events, SJFD personnel provided no direct medical treatment;
- Hospital emergency rooms treated and released 55 percent of transported EMS victims; and
- Of the 10 EMS victims in our sample who died, 4 were dead before the SJFD arrived. For 5 of the 10 EMS victims who died, the SJFD performed CPR. We could not tell when the tenth victim died.

SJFD And County Paramedic Services Provided

Both the SJFD and County paramedics provide service to citizens at the scene of an EMS event. SJFD personnel and equipment usually arrive at the EMS scene first and perform **Basic Life Support*** activities until the

* Refer to APPENDIX A: Glossary of Terms

County paramedics arrive to administer treatment, render **Advanced Life Support***, and transport the EMS victim(s).

The responding SJFD **unit*** radios a code to the Communications Center at the close of an EMS event to describe the type of service they rendered. (For a complete list of these codes, refer to APPENDIX J - Uniform Fire Incident Reporting System Codes.)

County paramedics record the medical treatment they provide on a **Pre-Hospital Care Report***. This information later becomes part of the patient's medical record. If the EMS call results in the County paramedics not transporting a victim to the hospital, the County paramedics code the EMS call as a "**Dry Run***".

30 Percent Of County Paramedic Responses Were "Dry Runs*"

There are times when both SJFD personnel and County paramedics respond to an EMS call but do not provide any treatment or transport. This situation is called a **Dry Run***. Our sample results showed that 30 percent of County paramedic EMS calls resulted in a **Dry Run***.

The reasons for a County paramedic **Dry Run***, as well as the frequency of occurrence in our sample, are shown in TABLE I.

* Refer to APPENDIX A: Glossary of Terms

TABLE I
SUMMARY OF COUNTY PARAMEDIC DRY RUNS

Dry Run Code Descriptions	Number Of Calls	Percent Of Dry Runs
Cancelled By Public Agency	70	43.7%
Patient Refused Transport	22	13.8%
Cancelled Before In-Service	18	11.2%
Cancelled, Patient Not Seen By Paramedics	13	8.1%
Transported By Police Agency	9	5.6%
Cancelled By Reporting Citizen	8	5.0%
Coroner's Case	5	3.1%
Unable To Locate	4	2.5%
Transport By Private Or Other Means	4	2.5%
Transport By Helicopter Or Other Ambulance	2	1.3%
Patient Refused All Help	2	1.3%
Prank Call	2	1.3%
All Other, Including Reassigned	<u>1</u>	<u>0.6%</u>
TOTAL DRY RUN CALLS	<u>160</u>	<u>100.0%</u>

“*Cancelled By Public Agency*” is the most frequent reason for an ambulance **Dry Run***, representing almost 44 percent of County paramedic **Dry Runs***. This occurs when the County paramedics are **en route***, but either do not arrive at the EMS scene or leave after arriving at the scene, because police, fire, or other public agency personnel tell the County paramedics they are not needed. “*Cancelled By Public Agency*”, along with “*Patient Refused Transport*,” account for over half of all County paramedic **Dry Runs***.

**The SJFD Took No Action After Arriving
At The Scene For 21 Percent Of EMS Calls**

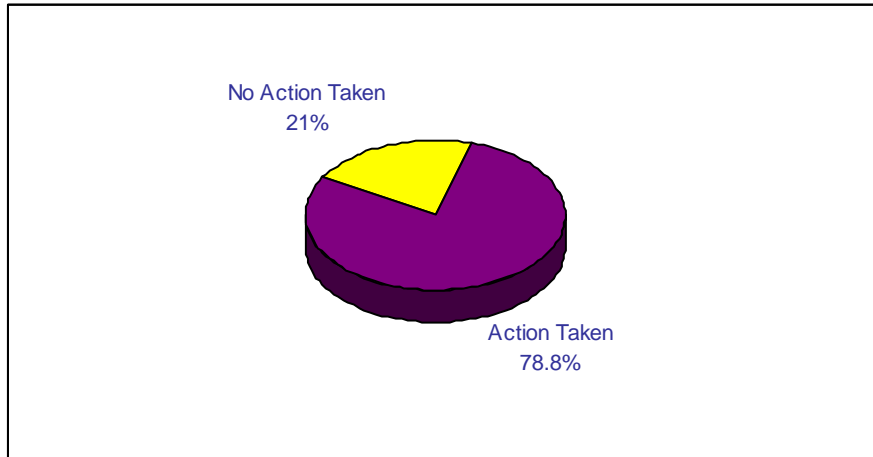
Similarly, SJFD personnel may be dispatched to an EMS scene but provide no service after they arrive. This is the SJFD’s version of a **Dry Run***.

* Refer to APPENDIX A: Glossary of Terms

As GRAPH 8 shows, the SJFD took no action after they arrived at 21 percent of the EMS events in our sample.

GRAPH 8

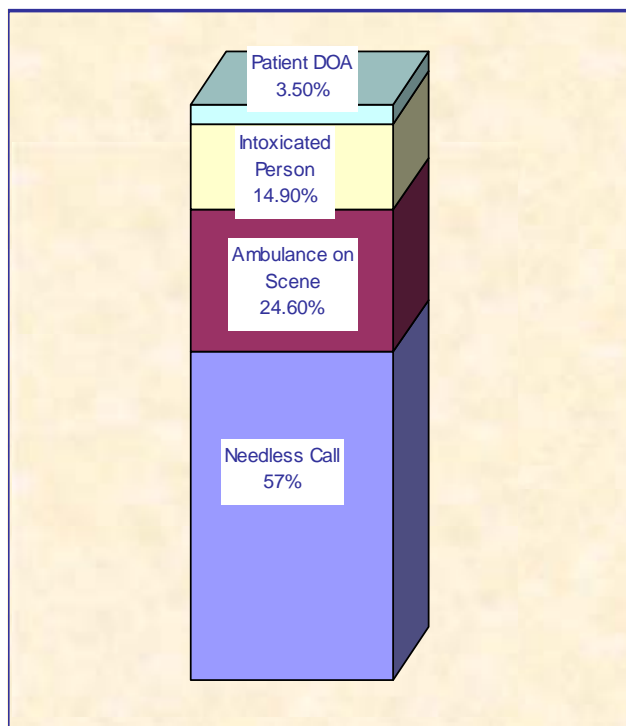
**SJFD ACTION TAKEN AFTER ARRIVING
AT THE SCENE OF SAMPLED EMS EVENTS**



For those EMS events in our sample when the SJFD took no action after arriving at the EMS scene, we found that 57 percent of the time the EMS event was described as a “*Needless Call*”. GRAPH 9 depicts the reasons why SJFD personnel took no action after arriving at the scene of sampled EMS events.

GRAPH 9

REASONS WHY SJFD TOOK NO ACTION AFTER RESPONDING TO THE SCENE OF EMS CALLS



There are several reasons why SJFD personnel would code an EMS call as a “*Needless Call*”. These reasons include good intent calls or false calls (see APPENDIX J). In these situations, SJFD personnel provide no service because a medical emergency does not exist.

The Most Frequent SJFD Action Taken In Response To An EMS Event Was Checking The Condition Of The Victim

For nearly 79 percent of the EMS calls in our sample, SJFD personnel took some action. The most frequent action SJFD personnel took was to check the condition of the victim. The second most common SJFD response to the EMS events in our sample was using a ventilator to give oxygen to a victim.

TABLE II summarizes SJFD actions taken for the EMS events in our sample.

TABLE II
SUMMARY OF SJFD ACTIONS TAKEN IN RESPONSE
TO EMS CALLS IN SAMPLE

<u>SJFD Actions</u>	<u>Number Of Calls</u>	<u>Percentage Of EMS Total Calls</u>
DIRECT MEDICAL TREATMENT		
Ventilator Used	89	16.5%
First Aid Kit Used	23	4.3%
CPR Performed	7	1.3%
Other Rescue	7	1.3%
Tool, Back Board, or Portapower Used	<u>10</u>	<u>1.9%</u>
Calls In Sample	136	25.3%
NON DIRECT MEDICAL TREATMENT		
Check Victim For Injuries, Vitals, etc.	269	50.0%
No Action, Needless Call	65	12.1%
No Action, Ambulance On Scene	28	5.2%
No Action, Intoxicated	17	3.2%
Other Investigation	11	2.0%
No Action, DOA	4	0.7%
Control Hazard	2	0.4%
Assist Citizen	2	0.4%
Other Miscellaneous Actions	4	.7%
Calls In Sample	<u>402</u>	<u>74.7%</u>
TOTAL CALLS IN SAMPLE	<u>538</u>	<u>100.0%</u>

**For 74.7 Percent Of The EMS Events Sampled,
SJFD Provided No Direct Medical Treatment**

TABLE II shows what SJFD personnel did at the scene for all the EMS calls in our sample, including the “*No Action Taken*” EMS events. Thus, for 74.7 percent of the EMS events in our sample, SJFD personnel provided no direct medical treatment to EMS victims, such as using a ventilator to

administer oxygen, performing CPR, or using first-aid kit supplies to dress a wound.

It should be noted that SJFD officials stated that SJFD personnel supplement and assist County paramedics as needed. Therefore, those EMS events coded as “*No Action, Ambulance on Scene*” would be the only times SJFD personnel would not provide some type of service to an EMS victim when a real EMS situation existed.

County Paramedic Services

County paramedics record the medical treatment they provide to EMS victims on the **Pre-Hospital Care Report***. This medical treatment information was not entered into the County’s EMS database and was therefore not available. As a result, we could classify County paramedic services only as either victim transported to a hospital or **Dry Run***.

Hospital Emergency Rooms Treated And Released 55 Percent Of Transported EMS Victims

We investigated and summarized the hospital emergency room disposition for the 378 EMS victims the County paramedics transported in our sample. Of these 378 EMS victims, the hospital emergency room treated and released 207, or nearly 55 percent. TABLE III summarizes the hospital emergency room dispositions for the 378 EMS victims that County paramedics transported.

* Refer to APPENDIX A: Glossary of Terms

TABLE III
HOSPITAL EMERGENCY ROOM DISPOSITIONS
FOR TRANSPORTED EMS VICTIMS

<u>Disposition:</u>	<u>Number Of Calls</u>	<u>Percentage Of Transports</u>
Treated And Released	207	54.8%
Admitted	94	24.9%
Unknown	70	18.5%
Transferred To Other Hospital	4	1.0%
Dead On Arrival	2	.5%
Died In Emergency Room	<u>1</u>	<u>.3%</u>
TOTAL PATIENT TRANSPORTS	<u>378</u>	<u>100.0%</u>

It should be noted that we could not determine the hospital emergency room disposition for 70 of the EMS victims that County paramedics transported.

10 EMS Victims Died

We identified through the various **Dry Run**^{*}, action taken, and hospital disposition codes that 10 of the EMS victims in our sample died. How callers reported these 10 EMS events to the 911 call-taker, how SJFD and County paramedics coded these events, and what actions the SJFD and the County paramedics took for each event is summarized in TABLE IV.

^{*} Refer to APPENDIX A: Glossary of Terms

TABLE IV**SUMMARY INFORMATION ON 10
VICTIM DEATHS IN EMS SAMPLE**

	<u>Details (Reported by Caller)</u>	<u>Age Of Victim</u>	<u>SJFD Incident Code</u>	<u>County Paramedic Nature Code</u>	<u>SJFD Action Taken Code</u>	<u>County Paramedic Dry Run Code</u>	<u>Hospital Emergency Room Disposition</u>
1.	Possible Dead Body	65	First Aid	Not Available	No action, Dead on Arrival	Coroner's Case	Victim Not Taken To Hospital
2.	Diabetic/ Possible Death	41	First Aid	Not Available	No action, Dead on Arrival	Cancelled by Public Agency	Victim Not Taken To Hospital
3.	Possible Dead Body	N/A	First Aid	Not Available	No action, Dead on Arrival	Coroner's Case	Victim Not Taken To Hospital
4.	Possible Dead Body	40	Other Rescue	Not Available	No action, Dead on Arrival	Cancelled by Public Agency	Victim Not Taken To Hospital
5.	Bleeding from Stomach	47	Resuscitation	Not Available	CPR Performed	Coroner's Case	Victim Not Taken To Hospital
6.	Possible Heart Attack	73	Resuscitation	Not Available	CPR Performed	Coroner's Case	Victim Not Taken To Hospital
7.	Fainted/ Passed Out	82	Resuscitation	Cardiac	CPR Performed	Not A Dry Run- Victim Transported	Dead On Arrival
8.	Fall/ Unknown Injury	88	Resuscitation	Cardiac	CPR Performed	Not A Dry Run- Victim Transported	Dead On Arrival
9.	Drowning	72	Resuscitation	Medical	CPR Performed	Not A Dry Run- Victim Transported	Died in Emergency Room
10.	Feels Faint	48	Other Rescue	Not Available	Other Type Investigation	Coroner's Case	Victim Not Taken To Hospital

Of the 10 EMS victims in our sample who died, 4 died before the SJFD arrived. The SJFD coded these events as “*No Action, Dead on Arrival.*” For 5 of the 10 EMS victims who died, SJFD performed CPR. Of these 5 victims, 2 died at the scene, while 2 died on the way to the hospital and 1 died in the hospital emergency room. We could not tell when the tenth victim died. For this victim, the SJFD described their response as “*Other Type Investigation*”, while the County paramedics recorded the event as a “*Coroner’s Case*”.

FINDING III

911 CALLERS, SJFD PERSONNEL, AND COUNTY PARAMEDICS DESCRIBED THE NATURE OF THE EMS EVENTS IN OUR SAMPLE VERY DIFFERENTLY

911 callers, SJFD personnel, and County paramedics all describe or categorize the nature of EMS events. For the 538 EMS events in our sample, we found that:

- 911 callers described the EMS incident as “*Chest Pains*”, “*Difficulty Breathing*”, or “*Not Breathing*” most frequently;
- SJFD codings of EMS events are medically nondescriptive; and
- County paramedics categorized EMS events as “*Medical*” most frequently.

Additionally, we found that in our sample:

- City Council District 6 had the most cardiac cases; and
- The average age of an EMS victim was 45.

Describing EMS Events

Call-takers answering 911 calls record a brief description of an EMS incident based on information the reporting party or caller gives. In addition, responding SJFD **units*** radio EMS incident type codes to the Communications Center after responding to a call (see APPENDIX J for a complete listing of these codes). Furthermore, County paramedics record the nature of an EMS event on a **Pre-Hospital Care Report*** (PCR). Thus, 911 call-takers, firefighters, and paramedics all record a description of an

* Refer to APPENDIX A: Glossary of Terms

EMS event. We noted that when firefighters and paramedics arrive at the scene of an EMS event, they sometimes find the actual EMS event to be very different from what the 911 caller described. We also noted that SJFD classifies EMS events less specifically than either 911 call-takers or County paramedics.

**911 Callers Described EMS Incidents
As “Chest Pains”, “Difficulty Breathing”,
Or “Not Breathing” Most Frequently**

When someone calls in an EMS incident, the 911 call-taker types the caller’s description of the incident into the “*Details*” field of his or her computer screen. The “*Details*” field is the most descriptive record of an EMS call as it was reported and dispatched and appears on both the **Fire Log*** and **Medical Case Log*** reports that we used in our study. We edited the “*Details*” field to group the types of calls for the 538 events in our sample into the same eleven categories the County paramedics use on the **PCR***. These categories are: Cardiac, Drowning, Falls, Medical, OB/GYN, Other, Poison, Seizure, Other Trauma, Traffic, and Violence.

911 callers described EMS events as “*Chest Pains, Difficulty Breathing, or Not Breathing*” most frequently. For our purposes, we considered such 911 caller descriptions to be cardiopulmonary in nature and grouped them under the “Cardiac” category. 911 callers described the EMS victims’ condition as “*Chest Pains*”, “*Difficulty Breathing*”, or “*Not Breathing*” for 17.1 percent of the EMS calls of our sample. 911 callers specifically reported possible heart attacks for 5.4 percent of the EMS calls in our sample.

* Refer to APPENDIX A: Glossary of Terms

We grouped other frequently used 911 caller incident descriptions in our sample under “*Medical*” and “*Other*” categories. TABLE V summarizes the number of EMS events in our sample by EMS category type.

TABLE V
911 CALLER DESCRIPTIONS
OF THE EMS EVENTS SAMPLED

<u>EMS Category Type</u>	<u>Number Of EMS Events In Sample</u>	<u>Percent Of EMS Events Sampled</u>
CARDIAC		
Chest Pains, Difficulty Breathing, and Not Breathing	92	17.1%
Possible Heart Attack	29	5.4%
Possible Stroke	<u>7</u>	<u>1.3%</u>
Subtotal	128	23.8%
MEDICAL		
Internal Bleeding, Cancer Patient, Fainted/Passed Out, Pain, Fever, Vomiting Blood, etc.	87	16.2%
OTHER		
Person Down	47	8.7%
Possible Dead Body	3	0.6%
Choking, Other Injury, Unknown Medical Problem, etc.	<u>36</u>	<u>6.7%</u>
Subtotal	86	16.0%
TRAFFIC		
Bicycle	11	2.0%
Auto, Pedestrian, Motorcycle	<u>67</u>	<u>12.4%</u>
Subtotal	78	14.4%
FALL		
Broken Bones, Head Injury, or Unknown Injury	53	9.9%
VIOLENCE		
Assault, Stabbing, and Shooting	29	5.4%
SEIZURE		
Seizure and Convulsions	26	4.8%
TRAUMA		
Body laceration, Finger Severed, Bleeding Wrist Slash, etc.	21	3.9%
POISON	15	2.8%
Possible Drug Overdose, Food Poison, etc.		
OB/GYN		
Labor, Miscarriage, Bleeding, Unknown Problem	13	2.4%
DROWNING	<u>2</u>	<u>.4%</u>
TOTAL	<u>538</u>	<u>100.0%</u>

It should be noted that a great variety of conditions may be grouped under the “*Medical*” category. Likewise, incidents described as “*Person Down*” could be a person sleeping, or intoxicated, or unconscious, or in shock, or even dead.

**SJFD Codings Of EMS Events
Are Medically Nondescriptive**

The SJFD codes the majority of EMS calls to which it responds under a general “*RESCUE CALL*” category. There are seven codes within the “*RESCUE CALL*” category, including “*First Aid*” and “*Resuscitation*” (see APPENDIX J).

Of our 538 sample EMS calls, SJFD coded 67.7 percent as “*First Aid*” and 19.9 percent as “*Resuscitation*”. TABLE VI shows the number and percent of SJFD codings for the EMS events in our sample. Responding fire **unit*** categorizations for the EMS events in our sample are also illustrated in the GRAPH 10.

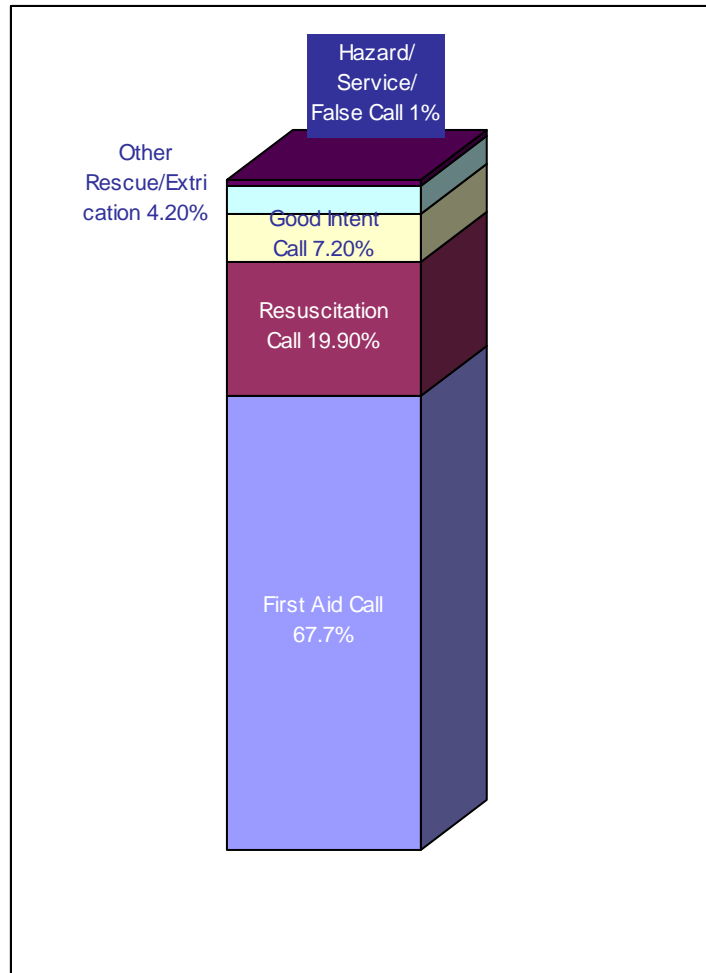
* Refer to APPENDIX A: Glossary of Terms

TABLE VI
RESPONDING FIRE UNIT
CATEGORIZATIONS OF SAMPLED EMS EVENTS

<u>Type Of EMS Incident</u>	<u>Number Of Sampled EMS Events</u>	<u>Percentage Of Sampled EMS Events</u>
RESCUE CALLS		
First Aid	364	67.7%
Resuscitation	107	19.9%
Other	20	3.7%
Extrication	<u>3</u>	<u>0.5%</u>
Subtotal	494	91.8%
GOOD INTENT CALL		
Other	39	7.2%
HAZARDOUS CONDITION		
Other	2	0.4%
SERVICE CALL		
Other	2	0.4%
FALSE CALL		
Malicious Mischief	<u>1</u>	<u>0.2%</u>
TOTALS	<u>538</u>	<u>100.0%</u>

GRAPH 10

SJFD CODINGS OF SAMPLED EMS EVENTS



County Paramedics Categorized EMS Events As “Medical” Most Frequently

The County paramedics who respond to an EMS call record the nature of the call on a **PCR*** form. The receiving hospital later completes the **PCR*** forms and forwards the form to the County Health Department EMS administration which enters the information into the County’s database on EMS events.

The **PCR*** has eleven “NATURE OF INCIDENT” categories for EMS calls. These **PCR*** categories are more medical in nature than the categories the SJFD uses. It should be noted that **PCR*** information is usually available only for those EMS calls that resulted in the paramedic transporting someone to a hospital³. In our sample of 538 EMS calls, we had 378 EMS events (70 percent) that resulted in a victim transport and for which **PCR*** information was analyzed. The remaining 30 percent of EMS calls in our sample were **Dry Runs***.

In our sample of 378 EMS victim transports, County paramedics categorized 41.8 percent as “*Medical*” and 15.1 percent as “*Traffic*” incidents. TABLE VII shows the number and percent of transports for each of the eleven County paramedic “*NATURE OF INCIDENT*” categories. This same information is shown in GRAPH 11.

* Refer to APPENDIX A: Glossary of Terms

³ Occasionally County paramedics complete a PCR* for an EMS call that did not result in a victim transport.

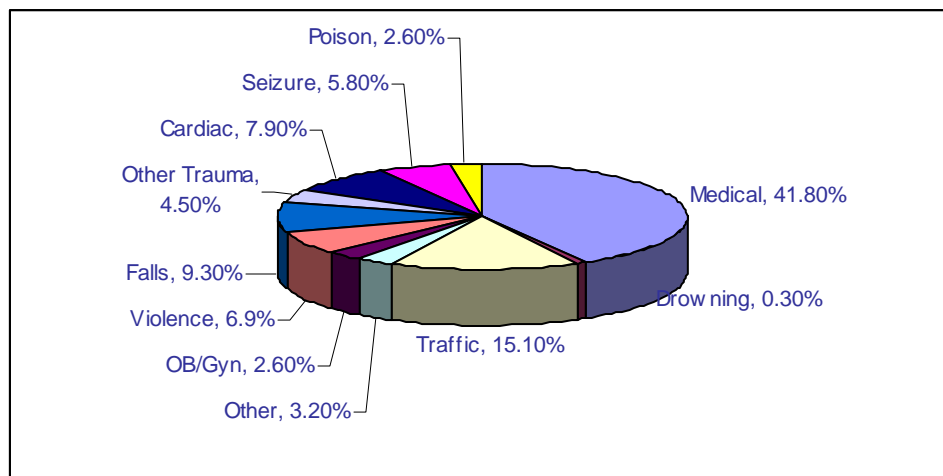
TABLE VII

COUNTY PARAMEDIC CATEGORIZATIONS OF EMS CALLS

<u>Nature Of Incident</u>	<u>Number Of Transports</u>	<u>Percentage Of Transports</u>
Medical	158	41.8%
Traffic	57	15.1%
Falls	35	9.3%
Cardiac	30	7.9%
Violence	26	6.9%
Seizure	22	5.8%
Other Trauma	17	4.5%
Other	12	3.2%
Poison	10	2.6%
OB/GYN	10	2.6%
Drowning	<u>1</u>	<u>0.3%</u>
TOTAL NUMBER OF TRANSPORTS IN SAMPLE	<u>378</u>	<u>100.0%</u>

GRAPH 11

COUNTY PARAMEDIC CATEGORIZATIONS OF SAMPLED EMS EVENTS RESULTING IN A VICTIM TRANSPORT



City Council District 6
Had The Most Cardiac Cases In Our Sample

County paramedics categorized 30 of the EMS calls in our sample as “Cardiac”. This represents 5.6 percent the EMS events in our sample and 7.9 percent of EMS victim transports. We analyzed the location of these cardiac cases by fire station and corresponding City Council District. The results are shown in TABLE VIII.

TABLE VIII

**SUMMARY OF CALLS THE COUNTY PARAMEDICS CATEGORIZED
AS CARDIAC BY FIRE STATION NUMBER
AND CITY COUNCIL DISTRICT**

<u>SJFD Station Number</u>	<u>Number Of EMS Calls</u>	<u>City Council District</u>
4	4	
6	3	
10	<u>3</u>	
Total	10	6
1	3	
5	2	
8	<u>2</u>	
Total	7	3
2	4	
16	<u>2</u>	
Total	6	5
13	1	
26	<u>2</u>	
Total	3	7
11	1	
24	<u>1</u>	
Total	2	8
12	Total	2
19	Total	4
TOTAL NUMBER OF CARDIAC CALLS	<u>30</u>	

As shown in TABLE VIII, Council District 6 had the most cardiac EMS events.

The Average Age Of An EMS Victim Was 45

We also analyzed data on the age of the persons involved in EMS events to which County paramedics responded. Of the 538 EMS events in our sample, the County paramedics recorded the age of the EMS victim for 411 EMS events. The mean average age of the persons involved in these 411 EMS events was 45, and the median age was 42. The range of ages was from 1 year old to 96.

Stratifying the ages of the victims in our sample into 20-year intervals shows the greatest concentrations to be in the 21 to 40 and 61 to 80-year old categories as shown in TABLE IX below:

TABLE IX
AGE OF SAMPLED EMS EVENT
VICTIMS GROUPED IN 20-YEAR INTERVALS

Age Range Of Victims	Number Of Calls	Percentage Of Calls
0-20	74	18.0%
21-40	125	30.4%
41-60	82	20.0%
61-80	93	22.6%
81-100	<u>37</u>	<u>9.0%</u>
NUMBER OF EMS CALLS FOR WHICH AGE WAS RECORDED	411	100.0%

FINDING IV

CITY COUNCIL DISTRICT 3 HAD THE HIGHEST VOLUME OF SAMPLED EMS EVENTS WHILE CITY COUNCIL DISTRICT 10 HAD THE LOWEST VOLUME

Part of our sampling plan was to determine where EMS events were occurring within San Jose. In addition, we wanted to quantify the SJFD's equipment response to EMS events. The results of our sample of 538 EMS events are as follows:

- Downtown fire stations accounted for nearly 23 percent of EMS call volume;
- Fire station response areas frequently overlap County Ambulance Service Zones;
- The **First Due Station*** responded to an EMS call within its response area 95.2 percent of the time;
- The SJFD responded to 23 percent of EMS calls with multiple vehicles;
- Because of the threat of grass fires, SJFD guidelines recommend that both the **Engine*** and **Patrol Tanker*** of a **Two Piece Engine Company*** respond to all EMS calls from May through October regardless of the nature of the EMS event; and
- Minimum SJFD staffing for an EMS call is three firefighters, including a captain.

* Refer to APPENDIX A: Glossary of Terms

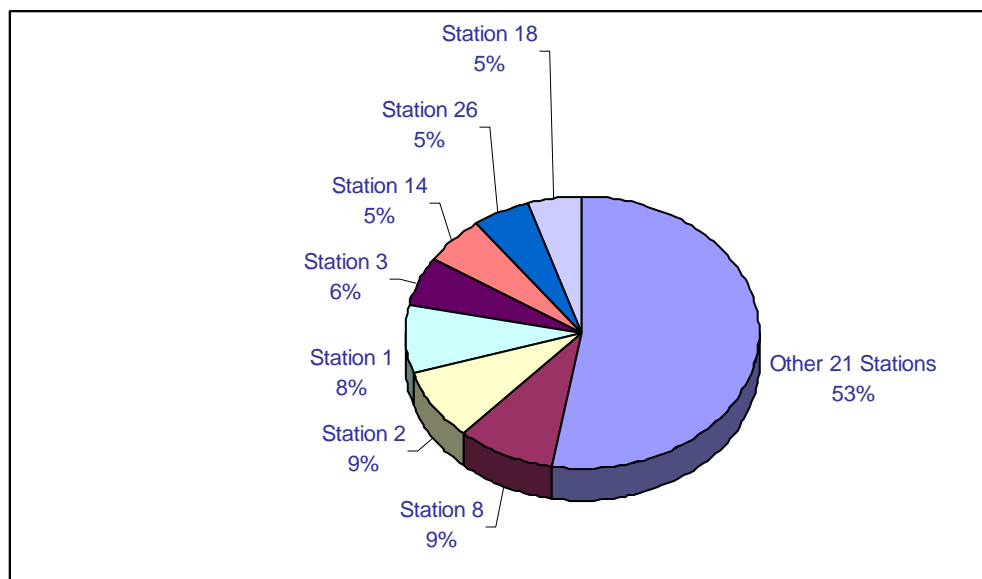
**Downtown Fire Stations Accounted
For Nearly 23 Percent Of EMS Call Volume**

A SJFD **unit*** responds to an EMS call from its fire station 94 percent of the time. Occasionally, a **unit*** will be available to accept a dispatch while they are out of their fire station. When this occurs, the **unit*** is said to be responding from the “air”. This only occurred for 6 percent of our sampled EMS events.

Usually, the first dispatched and responding fire **unit*** will be from the station nearest the EMS location. This station is designated as the **First Due Station*** because it has shortest **travel time*** to the EMS event. GRAPH 12 illustrates that seven fire stations (Fire Stations 1, 2, 3, 8, 14, 18, and 26) were the **First Due Stations*** for about half of our sampled EMS calls.

GRAPH 12

**PERCENTAGE OF SAMPLED EMS EVENTS
BY FIRST DUE STATIONS**



* Refer to APPENDIX A: Glossary of Terms

TABLE X lists the addresses and City Council Districts for the SJFD's 28 fire stations.

TABLE X
ADDRESSES AND CITY COUNCIL DISTRICTS
FOR SJFD FIRE STATIONS

Fire Station Number	Address	City Council District
1	201 N. Market Street	3
2	2933 Alum Rock Avenue	5
3	98 Martha Street	7
4	710 Leigh Avenue	6
5	1380 N. Tenth Street	3
6	1386 Cherry Avenue	6
7	800 Emory Street	3
8	802 East Santa Clara Street	3
9	3410 Ross Avenue	9
10	511 South Monroe Street	6
11	2840 The Villages Parkway	8
12	502 Calero Avenue	2
13	4380 Pearl Avenue	7
14	1201 San Tomas Aquino	1
15	1248 Blaney Avenue	1
16	2001 South King Road	5
17	1494 Ridgewood Drive	9
18	4430 S. Monterey Road	8
19	1025 Piedmont Road	4
20	1433 Airport Blvd	3
21	1749 Mt. Pleasant Road	8
22	6461 Bose Lane	10
23	1771 Via Cinco de Mayo	4
24	2525 Aborn Road	8
25	4758 Gold Street	4
26	528 Tully Road	7
27	239 Bernal Road	2
28	20399 Almaden Road	10

In addition, APPENDIX K is a map of San Jose showing the response areas for the above 28 fire stations.

Fire Station 8 was the First Due Station* for the highest volume of EMS calls in our sample (8.9 percent) followed closely by Fire Stations 2 and 1. Downtown Fire Stations 1, 3, and 8 together accounted for 23 percent of total EMS call volume. Fire Stations 11, 15, 25, and 28 had the lowest volume with less than 1 percent each.

GRAPH 13 below and TABLE XI show the First Due Station* frequency for the 538 EMS events in our sample by fire station.

GRAPH 13

**FREQUENCY OF FIRST DUE STATION DESIGNATIONS
BY FIRE STATION FOR SAMPLED EMS EVENTS**

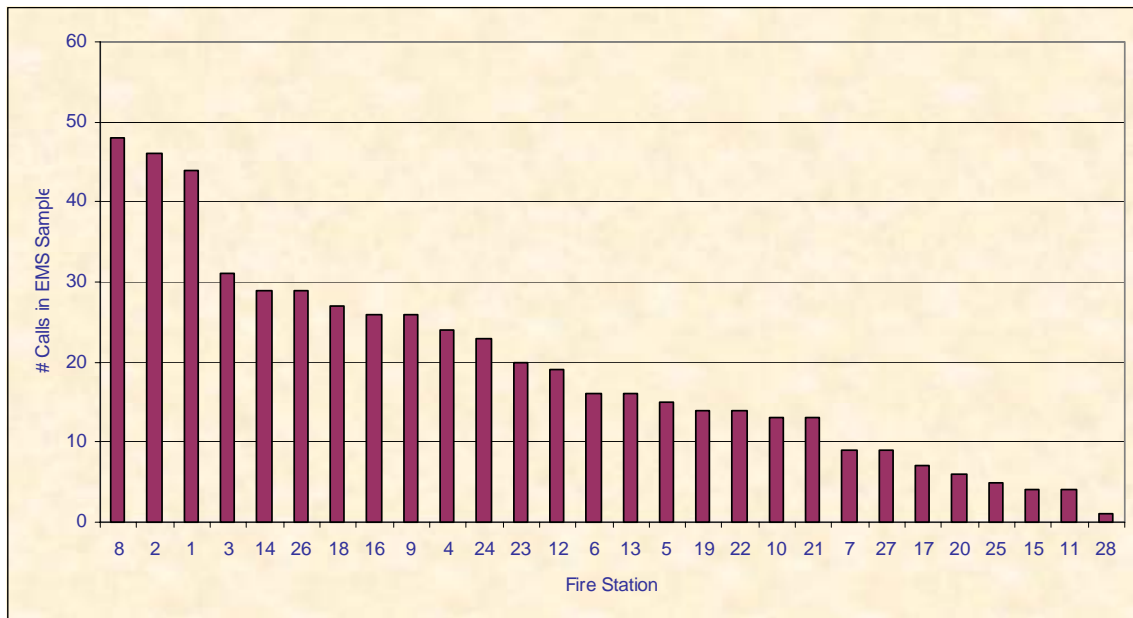


TABLE XI
SUMMARY OF FIRST DUE STATIONS
INCLUDED IN SAMPLE

<u>SJFD</u> <u>First Due</u> <u>Station Number</u>	<u>Number Of</u> <u>Calls In</u> <u>Sample</u>	<u>Percent Of</u> <u>Total Calls</u> <u>In Sample</u>
8	48	8.9%
2	46	8.6%
1	44	8.2%
3	31	5.8%
14	29	5.4%
26	29	5.4%
18	27	5.0%
16	26	4.8%
9	26	4.8%
4	24	4.5%
24	23	4.3%
23	20	3.7%
12	19	3.5%
6	16	3.0%
13	16	3.0%
5	15	2.8%
19	14	2.6%
22	14	2.6%
10	13	2.4%
21	13	2.4%
7	9	1.7%
27	9	1.7%
17	7	1.3%
20	6	1.1%
25	5	0.9%
15	4	0.7%
11	4	0.7%
28	<u>1</u>	<u>0.2%</u>
TOTAL CALLS IN SAMPLE	<u>538</u>	<u>100.0%</u>

TABLE XII summarizes, by City Council District, the number and percentage of EMS calls in our sample.

TABLE XII
SUMMARY OF THE PERCENTAGE
OF SAMPLED EMS CALLS BY CITY COUNCIL DISTRICT

<u>City Council District</u>	<u>Number Of Calls In Sample</u>	<u>Percentage Of Sampled EMS Calls</u>
3	122	22.7%
7	76	14.1%
5	72	13.4%
8	67	12.5%
6	53	9.9%
4	39	7.2%
1	33	6.1%
9	33	6.1%
2	28	5.2%
10	<u>15</u>	<u>2.8%</u>
TOTAL	<u>538</u>	<u>100.0%</u>

As shown in TABLE XII, City Council District 3 had the highest volume of sampled EMS events while City Council District 10 had the lowest volume.

Fire Station Response Areas
Frequently Overlap County Ambulance Service Zones

The County's contracted paramedics provide ambulance service from 15 Ambulance Service Zones in Santa Clara County. Of these 15 Ambulance Service Zones, 10 are in San Jose fire response areas. TABLE XIII lists the Ambulance Service Zones and SJFD fire stations in each zone.

TABLE XIII
SJFD FIRE STATIONS WITHIN
COUNTY AMBULANCE SERVICE ZONES

<u>SJFD Fire Station Response Areas</u>	<u>County Ambulance Service Zones</u>	<u>Number Of Calls In Sample</u>	<u>Percent Of Total Calls</u>
1/3/4/5/7/8	1	111	20.6%
4/7/10/14/20/25	2	26	4.8%
4/6/9/10/14	3	62	11.5%
3/4/6/8/9/13/16/18/24/26	4	93	17.3%
5/19/23/25	5	25	4.6%
12/13/17/18/22/27/28	6	74	13.8%
9/17	7	3	0.6%
2/11/16/21/24	13	76	14.1%
14/15	14	5	0.9%
2/5/8/16/19/23	15	<u>63</u>	<u>11.7%</u>
TOTAL CALLS IN SAMPLE		<u>538</u>	<u>100.0%</u>

As shown above, SJFD fire station response areas frequently overlap Ambulance Service Zones. For example, Fire Station 4's response area includes parts of Ambulance Service Zones 1, 2, 3, and 4 while Fire Station 5's response area includes parts of Ambulance Service Zones 1, 5, and 15. Only 10 fire stations (Stations 1, 11, 12, 15, 20, 21, 22, 26, 27 and 28) have response areas that are totally within one single Ambulance Service Zone. Of those 10 fire stations, 4 (Stations 12, 22, 27, and 28) have response areas that are totally within Ambulance Service Zone 6. Finally, Ambulance Service Zone 4 contains parts of the response areas of 10 fire stations (Stations 3, 4, 6, 8, 9, 13, 16, 18, 24, and 26).

GRAPH 14 is a matrix showing the relationship between SJFD fire station response areas and County Ambulance Service Zones.

GRAPH 14

MATRIX OF RELATIONSHIP BETWEEN SJFD FIRE STATION RESPONSE AREAS AND COUNTY AMBULANCE SERVICE ZONES

County Ambulance Service Zones

	1	2	3	4	5	6	7	13	14	15
1	X									
2								X		X
3	X			X						
4	X	X	X	X						
5	X				X					X
6			X	X						
7	X	X								
8	X			X						X
9			X	X			X			
10		X	X							
11								X		
12						X				
13				X		X				
14		X	X						X	
15									X	
16				X				X		X
17						X	X			
18				X		X				
19					X					X
20		X								
21								X		
22						X				
23					X					X
24				X				X		
25		X			X					
26				X						
27						X				
28						X				

It should be noted that the County's ambulance dispatch method is substantially different from the SJFD's method. Specifically, ambulances are usually dispatched while they are in transit; whereas, SJFD equipment is usually dispatched from a garaged location. As a result, County paramedics respond to EMS calls within their assigned Ambulance Service Zones only 40 percent of the time.

**The First Due Station Responded
To An EMS Call Within Its Response Area
95.2 Percent Of The Time**

Sometimes the SJFD **unit*** first responding to the scene of an EMS event is not from the **First Due Station***. When this happens, the **unit*** is responding outside its station's response area. For 512 of 538 (95.2 percent) EMS events in our sample, the **first responding unit*** was responding from its own station area. Thus, for only 4.8 percent of our sample, a **unit*** from the **First Due Station*** was unable to respond. TABLE XIV below shows how often each fire station responded out of its response area or was unable to respond as the **First Due Station***.

* Refer to APPENDIX A: Glossary of Terms

TABLE XIV

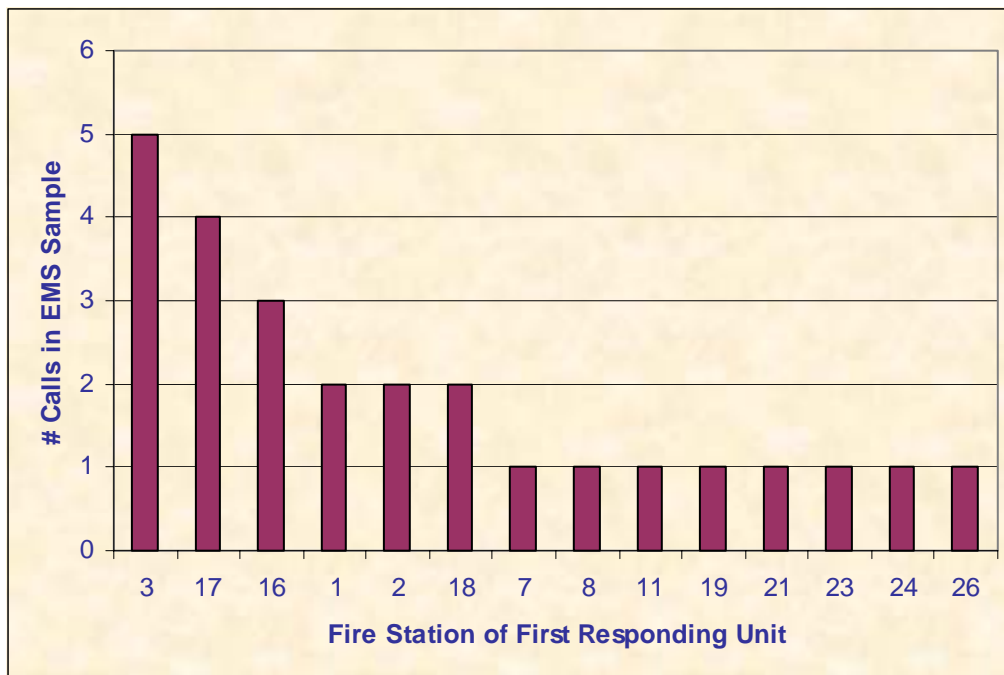
**NUMBER OF TIMES FIRE STATIONS
RESPONDED OUT OF STATION AREA OR
WERE UNABLE TO RESPOND AS FIRST DUE STATION**

<u>First Responding Unit From Station Number</u>	<u>Total Number Of Calls To Which Station Responded</u>	<u>Number Of Calls Station Was First Due Station</u>	<u>Number Of Calls The Station Responded To Out Of Its Station Area</u>	<u>Number Of Calls The Station Was Unable To Respond To As the First Due Station</u>
1	45	44	2	1
2	48	46	2	0
3	36	31	5	0
4	24	24	0	0
5	13	15	0	2
6	15	16	0	1
7	10	9	1	0
8	43	48	1	6
9	26	26	0	0
10	13	13	0	0
11	5	4	1	0
12	16	19	0	3
13	16	16	0	0
14	29	29	0	0
15	4	4	0	0
16	29	26	3	0
17	11	7	4	0
18	28	27	2	1
19	12	14	1	3
20	6	6	0	0
21	14	13	1	0
22	11	14	0	3
23	20	20	1	1
24	21	23	1	3
25	5	5	0	0
26	28	29	1	2
27	9	9	0	0
28	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>
TOTALS	538	538	26	26

As shown in TABLE XIV, Fire Station 3 most often responded to EMS calls outside of its response area (5 times) while Fire Station 8 was most often unable to be the first responder* to calls within its own response area (6 times). GRAPH 15 displays the number of times fire stations responded to EMS calls outside of their response area. GRAPH 16 displays the number of times fire stations were unable to be the first responder* to EMS calls in their response area.

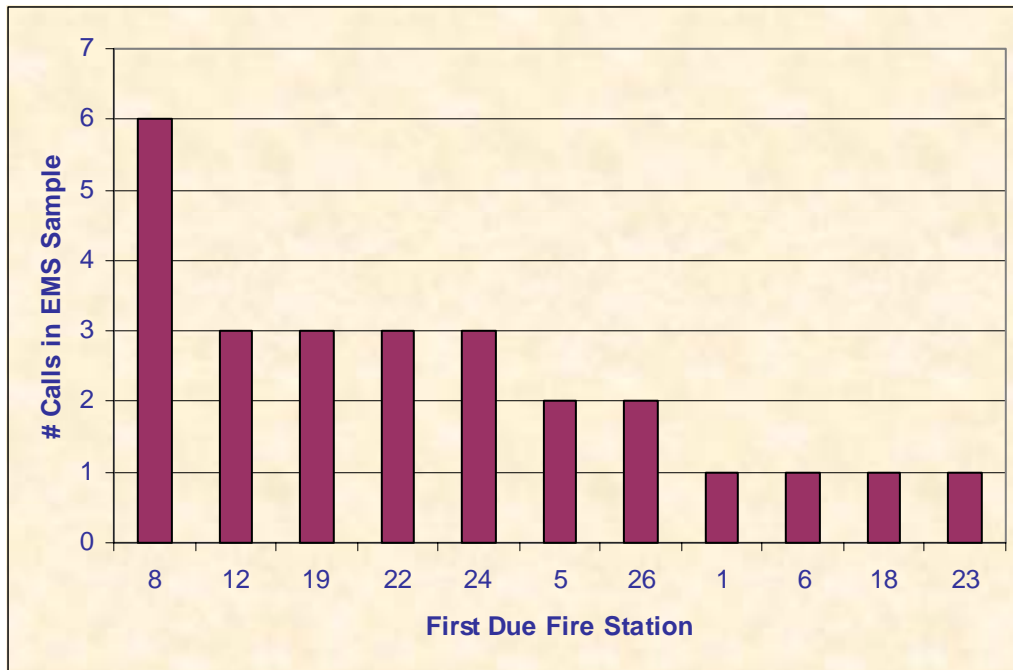
GRAPH 15

**NUMBER OF TIMES FIRE STATIONS RESPONDED
OUT OF THEIR RESPONSE AREA FOR SAMPLED EMS EVENTS**



GRAPH 16

**NUMBER OF TIMES FIRE STATIONS
WERE UNABLE TO RESPOND IN THEIR OWN RESPONSE AREA
FOR SAMPLED EMS EVENTS**



**The SJFD Dispatched Multiple Vehicles
For 23 Percent Of EMS Calls In Our Sample**

For a majority of the EMS calls in our sample (77 percent), the SJFD responded with one vehicle. Most often the SJFD responded to sampled EMS events with an **Engine***, although sometimes a larger **Truck*** responded, or a **Hose Wagon*** or **Patrol Tanker***. However, for 23 percent of the EMS calls in our sample, the SJFD dispatched multiple vehicles.

In our sample, there were 126 instances when multiple SJPD vehicles responded to an EMS call. Fire Stations 2, 14, 21, and 24 had the highest

* Refer to APPENDIX A: Glossary of Terms

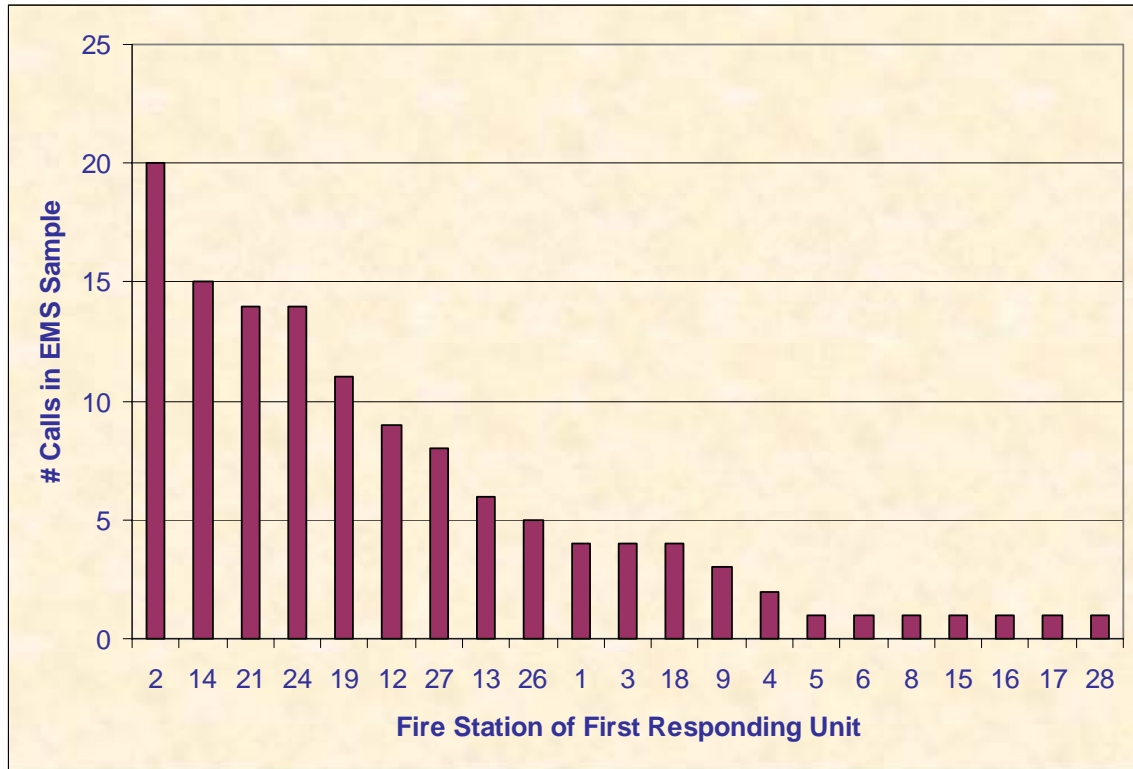
number of calls with multiple vehicles responding as shown in TABLE XV and GRAPH 17.

TABLE XV
NUMBER OF TIMES FIRE STATIONS
RESPONDED TO SAMPLED EMS CALLS
WITH MULTIPLE VEHICLES

<u>Fire Station Number</u>	<u>Number Of Times Station Responded With Multiple Vehicles</u>	<u>Percent Of Multiple Vehicle Responses In Sample</u>
2	20	15.9%
14	15	11.9%
21	14	11.1%
24	14	11.1%
19	11	8.7%
12	9	7.1%
27	8	6.3%
13	6	4.8%
26	5	4.0%
1	4	3.2%
3	4	3.2%
18	4	3.2%
9	3	2.4%
4	2	1.5%
5	1	0.8%
6	1	0.8%
8	1	0.8%
15	1	0.8%
16	1	0.8%
17	1	0.8%
28	<u>1</u>	<u>0.8%</u>
TOTAL MULTIPLE VEHICLE RESPONSES	<u>126</u>	<u>100.0%</u>

GRAPH 17

**NUMBER OF TIMES FIRE STATIONS RESPONDED
WITH MULTIPLE VEHICLES FOR SAMPLED EMS EVENTS**



The type of EMS events for the 126 multiple vehicle responses in our sample is shown in TABLE XVI.

TABLE XVI
TYPE OF EMS EVENTS
FOR THE MULTIPLE VEHICLE RESPONSES SAMPLED

<u>Type Of EMS Event</u>	<u>Number Of Multiple Vehicle Responses</u>	<u>Percent Of Total</u>
Traffic	39	31.0%
Medical	23	18.0%
Cardiac	16	13.0%
Other	15	12.0%
Fall	13	10.0%
Trauma	6	5.0%
Violence	4	3.0%
Seizure	4	3.0%
Poison	2	2.0%
OB/GYN	3	2.0%
Drowning	<u>1</u>	<u>1.0%</u>
TOTAL MULTIPLE VEHICLE RESPONSES	<u>126</u>	<u>100.0%</u>

**Because Of The Threat Of Grass Fires,
SJFD's Guidelines Recommend That
Both The Engine And Patrol Tanker
Of A Two-Piece Engine Company Respond To All EMS Calls
From May Through October Regardless
Of The Nature Of The Event**

In part, the number of SJFD vehicles responding to an EMS call is determined by the severity of the emergency. For example, multiple SJFD vehicles would respond to a traffic accident involving several seriously injured persons. However, that same level of response would probably not be required if the EMS event was not serious and involved only one person. An exception to this rule is SJFD's guideline calling for both the

Engine* and **Patrol Tanker*** of a **Two-Piece Engine Company*** to respond to EMS calls from May through October. This guideline exists because of the increased threat of grass fires during those months.

It should be noted that the above SJFD guideline only applies to those fire stations with both an **Engine*** and **Patrol Tanker***. Further, while the SJFD highly recommends this guideline, it is not mandatory. It should also be noted that this **Engine*** and **Patrol Tanker*** response guideline applies to all EMS events, not just those that could involve fires, such as traffic accidents. Finally, when both an **Engine*** and **Patrol Tanker*** respond to an EMS event, there would be at least four firefighters involved, including a captain. The SJFD has six fire stations with both an **Engine*** and “**First Line**” **Patrol Tanker*** (Fire Stations 2, 12, 19, 21, 24, and 27).⁴

In our sample, a **Patrol Tanker*** was the second responding vehicle for 52 percent (65 of 126) of the EMS calls to which multiple vehicles responded. Of these 65 calls, Fire Station 21 responded to 13 calls, while Fire Stations 2 and 24 responded to 12 calls each. These three stations are all located in the East and Evergreen areas near hillsides where grass fires are likely to occur. Therefore, many of the multiple vehicle responses to EMS calls in our sample were probably due to the SJFD’s grass fire season guideline rather than the nature of the EMS events.

* Refer to APPENDIX A: Glossary of Terms

⁴ SJFD Fire Stations 1, 4, 9, 15, 16, and 26 have “*Reserve*” **Patrol Tankers***. According to SJFD officials these vehicles would not normally accompany an **Engine*** when responding to an EMS call.

Further analysis of the 126 multiple vehicle responses to EMS calls in our sample revealed that 31 percent were in response to traffic accidents. The fire stations with the highest number of traffic accident calls were Fire Station 2 (8 calls) and Fire Station 14 (6 calls). According to SJFD officials, Fire Station 2 is responsible for responding to traffic accidents located at the Interstate Highway 280 and U.S. Highway 101 interchange, and that Fire Station 14 is responsible for responding to traffic accidents at the Interstate Highways 280 and 880 interchange. Traffic accidents accounted for 8 of Fire Station 2's 20 multiple vehicle responses and for 6 of Fire Station 14's 15 multiple vehicle responses.

Based upon our analysis, it appears that 31 percent of multiple vehicle responses were the result of traffic accidents, while 40 percent were the result of the SJFD's guideline for EMS responses during grass fire season.

**Minimum SJFD Staffing For An EMS Call
Is Three Firefighters, Including A Captain**

The SJFD does not report the actual number of firefighters responding to EMS calls. There are, however, ways to approximate these numbers. For example, at least three firefighters respond to EMS calls classified as "First Aid" or "Resuscitation." The SJFD also requires that a captain respond to all EMS calls. Thus, a typical response to an EMS call would be an **Engine*** with a minimum of three firefighters, including the captain. However, if an **Engine*** and **Patrol Tanker*** respond, there would be at least four firefighters involved including a captain.

* Refer to APPENDIX A: Glossary of Terms

FINDING V

THE CITY'S NEW COMMUNICATIONS CENTER USES A DISPATCH SEQUENCE THAT WILL RESULT IN COUNTY PARAMEDICS TAKING LONGER TO RESPOND TO EMS EVENTS IN SAN JOSE

Prior to October 1990, 911 call-takers, Santa Clara County medical dispatchers and SJFD fire dispatchers were all housed in Santa Clara County's Communications Center. On October 1, 1990, the City of San Jose opened its new Communications Center and assumed responsibility for: 1) answering 911 calls originating within its jurisdiction, 2) dispatching City personnel as appropriate, and 3) notifying the County medical dispatcher if an EMS event was involved. During our review of EMS, we noticed that the conversion to the City's new Communications Center could very likely result in County paramedics taking longer to respond to EMS events in San Jose.

The Dispatch Sequence For EMS Events In San Jose Prior To October 1990

From June 1990 to October 1990, the dispatch sequence for EMS events in San Jose was as follows:

- _ A person would call 911 and report an EMS event.
- _ The 911 call-taker at the County's Communications Center would verify the EMS event location and enter a description of the event on his or her computer screen.

- _ The 911 call-taker would use his or her computer to electronically transmit the EMS information to the County medical dispatcher and the SJFD fire dispatcher.⁵
- _ The medical dispatcher initiated the dispatching of County paramedics.
- _ The SJFD fire dispatcher initiated the dispatching of SJFD personnel.

**The Dispatch Sequence For EMS Events
In San Jose Since October 1, 1990**

On October 1, 1990, the City of San Jose opened its new Communications Center and assumed responsibility for answering 911 calls originating within its jurisdiction, dispatching City personnel, as appropriate, and notifying the County medical dispatcher if an EMS event was involved. The significance of the change to the new Communications Center for EMS lies in the fact that there is no longer an electronic hook-up between the 911 call-taker and the County medical dispatcher. As a result, the 911 call-taker can electronically transmit EMS information only to the SJFD fire dispatcher, not the County medical dispatcher. Instead, the fire dispatcher has to telephone the County medical dispatcher and verbally repeat the EMS event information. Thus, it should take longer to dispatch County paramedics using the City's new Communications Center than it did using the County's Communications Center. In addition, the new dispatch process appears to increase the chances of miscommunication or even

⁵ The exact sequence of notification could vary. In other words, sometimes the 911 call-taker would send EMS information to the County medical dispatcher first, sometimes to the SJFD fire dispatcher first, and sometimes to both dispatchers simultaneously. The important point here is not who the 911 call-taker notified first, but rather that both dispatchers were notified within a matter of seconds.

noncommunication between the fire dispatcher and the County medical dispatcher.

As noted in FINDING I, SJFD personnel arrived first to EMS events 86 percent of the time. The SJFD Chief acknowledged that the number of instances when SJFD personnel arrive at an EMS event before the County paramedics should increase because of the new Communications Center's dispatch sequence. According to SJFD officials, prior to the opening of the City's Communications Center, there was a computer link between the City's and County's Communications Centers. However, at the time of the changeover to the City's Communications Center, the County requested that the computer link be removed. There are no immediate plans to add a computer link between the City's and County's Communications Centers.

In our opinion, the new City Communications Center dispatch sequence will place more reliance on the **Basic Life Support*** services SJFD personnel provide to EMS victims. This is because SJFD personnel should arrive at the EMS scene before the County paramedics more often and be at the EMS scene longer before the paramedics arrive. As a result, San Jose citizens will not receive the **Advanced Life Support*** services the County paramedics provide as quickly as before the City's new Communications Center opened.

The City Auditor's 1991-92 Proposed Workplan will include an audit of the City's new Communications Center. This audit would include a review of the City's new EMS dispatch process.

* Refer to APPENDIX A: Glossary of Terms